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DECUS NO.	8-136
TITLE	Fourier Transform Program
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DATE	May 1, 1968
SOURCE LANGUAGE	

20330

11/10/54 11/10/54



The following listing is the only available information on this program.


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L      ;FOURIER TRANSFORM PROGRAM IN PDF-8 FORTRAN II
C      ;NTWO IS THE NUMBER OF FUNCTION POINTS
C      ;FNTWO IS NTWO IN FLOATING POINT
C      ;N IS NTWO/2 (FRACTIONAL PART IS TRUNCATED)
C      ;M INDEXES THE HARMONICS
C      ;IX INDEXES THE FUNCTION VALUES
C      ;K (=IX+1) INDEXES THE STORAGE OF FUNCTION VALUES
C      ;FX IS IX IN FLOATING POINT
C      ;A IS THE COSINE TERM COEFFICIENT
C      ;B IS THE SINE TERM COEFFICIENT
C      ;U (=S*FX*T) IS THE ARGUMENT OF THE SINE AND COSINE
C      ;FUNCTIONS. IT IS COMPUTED IN THREE STEPS TO MINIMIZE
C      ;UNNECESSARY COMPUTATIONS
C      ;
C      ;READ NUMBER OF FUNCTION POINTS AND CHECK THAT NUMBER
C      ;LESS THAN 201
5      ;TYPE 105
      ;ACCEPT 110,NTWO
      ;IF (NTWO-200) 15,15,10      NT < 200
10     ;TYPE 115
      ;GO TO 5
15     ;N=NTWO/2
      ;FNTWO=NTWO
      ;DIMENSION F(200)
C      ;READ IN FUNCTION VALUES
      ;DO 20 K=1,NTWO
      ;IX=K-1
      ;TYPE 120,IX
      ;ACCEPT 125,F(K)
20     ;CONTINUE
      ;TYPE 130
      ;S=2.0*3.141593/FNTWO
C      ;ITERATE OVER HARMONIC VALUES
21     ;DO 35 M=0,N
      ;A=B=0.0
      ;FM=M
      ;T=FM*S
      ;J=NTWO-1
C      ;SUM OVER FUNCTION VALUES
22     ;DO 30 IX=0,J
      ;FX=IX
      ;U=T*FX
      ;K=IX+1
      ;A=A+F(K)*COSF(U)
      ;B=B+F(K)*SINF(U)
30     ;CONTINUE      d.c. comp. a.
      ;IF (M) 305,32,305
305    ;IF (NTWO-2*M) 31,32,31
31     ;A=2.0*A/FNTWO
      ;B=2.0*B/FNTWO
      ;TYPE 135,M,A,B
      ;GO TO 35
32     ;A=A/FNTWO
      ;B=0.0
      ;TYPE 135,M,A,B
35     ;CONTINUE
      ;PAUSE

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Read samples in E format

F

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C          ;HIT CONTINUE KEY TO RESTART PROGRAM
          ;GO TO 5
105        ;FORMAT(//,"NUMBER OF DATA POINTS =")
110        ;FORMAT(I)
115        ;FORMAT("NUMBER TOO LARGE")
120        ;FORMAT("DATA POINT ",I," = ")
125        ;FORMAT(E)
130        ;FORMAT(//,"HARMONIC    COSINE          SINE",//)
135        ;FORMAT(I,"    ",E,E,/)
          ;END

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